

ZOO GOER

May-June 1986



The Fate of
the Tropics (p. 4)

LOOKING FORWARD TO GREATER GROWTH



Dear FONZ Member:

Please allow me the opportunity and great pleasure of introducing myself to you. While I only just arrived a short time ago, the FONZ family has already made me feel most welcome, and I cannot thank everyone enough for their warm hospitality. I look forward to having the opportunity to meet more of you during the coming year, and I am sure I will, whether it be at ZooNight or on a stroll through the Park.

As your new Executive Director, I look forward to a long and very rewarding relationship with the Friends of the National Zoo and the National Zoological Park. I have great hopes and aspirations for both FONZ and the Zoo. I know, working together, we will ensure that FONZ continues as the best zoological membership support organization and that the National Zoo remains as the most important zoo in the country.

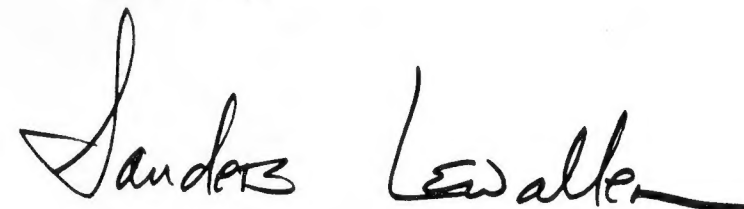
I would like to take the time here to present some of my ideas for furthering the FONZ mission. I believe we have accomplished much over the past 18 years—growing from a small “neighborhood” group to over 50,000 members—and I foresee a period of even greater growth in membership and our support of the Zoo in the years ahead. With your help, I look forward to playing a vital role in this renaissance of FONZ and the Zoo.

I envision:

- Substantial membership growth which, along with our award-winning volunteer force—the heart of FONZ—will play a greater role in supporting the Zoo and its programs, helping to ensure that the National Zoological Park continues at the leading edge of wildlife research and conservation activities, with continued growth and development of “state of the art” animal and plant habitats.
- Continued improvements in our food and gift activities to maintain their high quality.
- A renewed and even greater commitment to reaching out to the business and civic communities for their support, promoting a sense of pride and participation in our National Zoo.
- An increased national awareness and role for FONZ and the Zoo.

Working together, there are no limitations to what we can achieve! It is indeed great to be here!

Sincerely,



Sanders E. Lewallen
Executive Director
Friends of the National Zoo

ZOOGOER

Volume 15, Number 3, May-June 1986

Friends of the National



is a nonprofit organization of individuals and families who are interested in supporting Zoo programs in education, research, and conservation. As members of FONZ, you and your family receive many benefits—publications, discount privileges, and invitations to special programs and activities to make your zoogoing more enjoyable and educational.

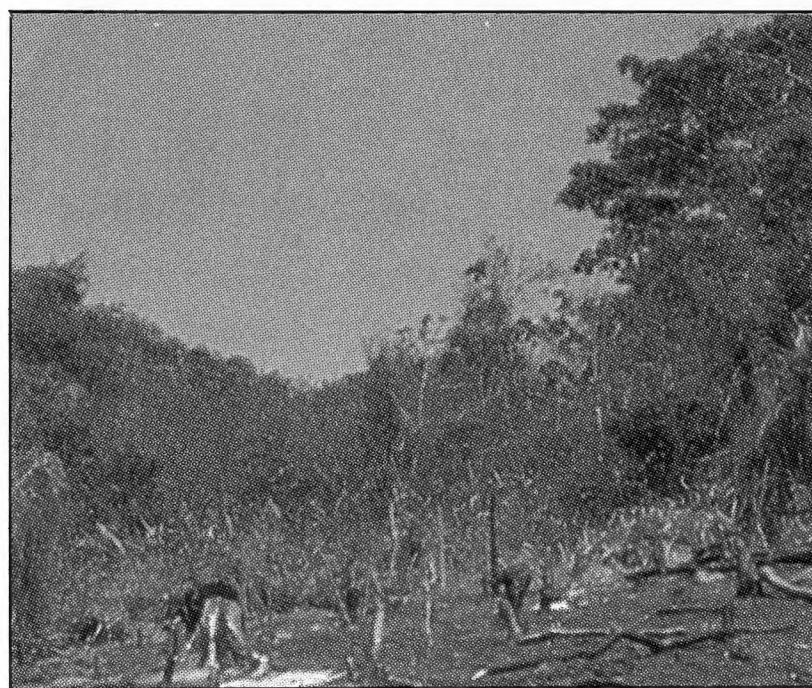
ZooGoer [ISSN 06313-416X] is published six times a year by Friends of the National Zoo, National Zoological Park, Washington, D.C. 20008. Non-member subscription is \$7.50 a year and is available only to institutions and to those residing outside the Washington, D.C., area. Third class mailing permit no. 6282. Copyright © 1986, Friends of the National Zoo. All rights reserved.

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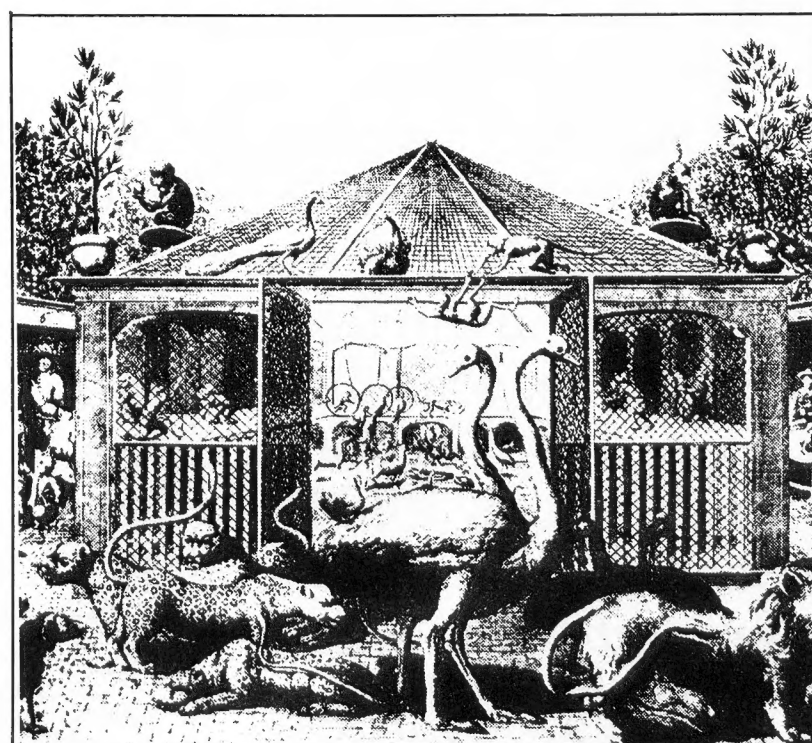
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Cover Photos: The fate of the iguana, like millions of other tropical species, is closely linked with that of its habitat, the South American rainforest ("The Fate of the Tropics," page 4). Back cover: The Zoo's newest primates are champion grape-peelers, as this male demonstrates. These golden-headed lion tamarins—the first of their species ever exhibited in the U.S.—have a dramatic past ("Detective Story," page 22). Photos by Jessie Cohen, NZZ Office of Graphics and Exhibits.



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Ten million years ago, tapirs very much like the Zoo's new pair roamed the Americas and Asia.

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by Betsy Blair

The sense of wonder and awe humans feel about living wild animals is as powerful now as it was in ancient times.

Notes & News

Golden-headed lion tamarins, spectacled bear cubs, and a white tiger are among the Zoo's new animals.

Make Your Friends Our Friends

Give your friends and relatives a FONZ membership. Annual dues range from \$7.50 (for people residing outside the D.C. area) to \$35 (for families). Call 202/673-4960 for more information or to place your order.

The Fate of the Tropics and the Fate of Man

Michael H. Robinson

Most biologists regard tropical regions as biological paradises, but few are lucky enough to spend time there. I was singularly fortunate in working for the Smithsonian Tropical Research Institute for nearly 20 years and in that time visiting more than 20 tropical countries. Although based in Panama, a tiny country which nonetheless has more species of birds than the entire continental United States, I also spent time in Africa, Asia, Australasia, and in other parts of Latin America.

I know from direct experience that these are the biologically richest and most diverse regions on the surface of the earth and that the tropical rainforest is the priceless jewel of our natural heritage. I would also argue that life on earth, our natural heritage, is much more important than our national heritage since it represents the accumulation of thousands of millions of years of earth history, whereas our national heritage extends only in hundreds or thousands of years.

When I came to Washington, many people asked me if I would miss the tropics. My usual answer was somewhat flip but also accurate: I said that at the National

Zoo I would be surrounded by the tropics since a substantial proportion of zoo animals are tropical. This is true of nearly all zoos; it is a fact related to the richness of the tropics and the magnificence of tropical animals.

What is the extent of the biological richness of the tropics? The answer is that we have only the vaguest glimmerings of an idea. The world distribution of biologists is inversely proportional to the world distribution of plants and animals. The biologists are concentrated in the wealthy temperate regions, while living things are concentrated in the countries of the developing Third World. For most groups of living things, we know that few temperate species remain to be discovered, yet we have no idea how many

species occur in the tropics. This is true of both animals and plants. I tend to be obsessively interested in animals, so I recently asked Dr. Ray Fosberg, Botanist Emeritus of the National Museum of Natural History, to compare the richness of tropical and temperate species of plants. Ray Fosberg has a literally immense international experience. His guess, which he cautioned was crude, is that 75 percent of all terrestrial vascular plants occur in the tropics. On the other hand, his guess was that more than 90 percent of botanical studies have been carried out in the temperate region.

Undiscovered Species

A recent study by Dr. Terry Erwin, an entomologist at the National Museum of Natural His-



Judith Gradwohl

Dr. Robinson, Director of the National Zoo, says, "I hope that this article provokes some thought about global problems, and I would really appreciate hearing from ZooGoer readers on this topic."

A stack of tropical fuelwood—vital to human survival in poor countries—may once also have been part of a habitat vital to the survival of numerous tropical forest animals.

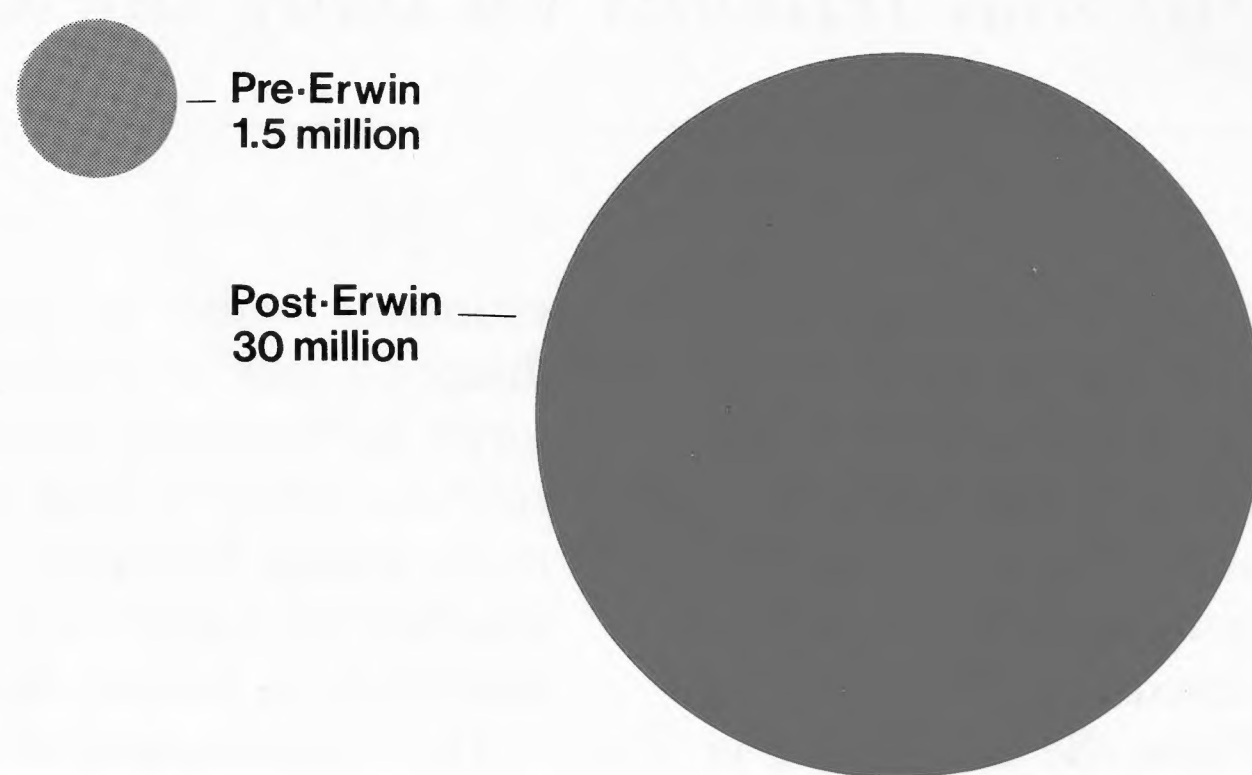
tory, has shown that there are great numbers of insect species still to be discovered in the tropics. He sampled the insects of the tropical forest and estimates that there are probably from 15 to 30 million species of insects in the world instead of the 0.75 to 1.5 million previously estimated.

This remarkable (and recent) shift in our estimates is the result of ingenuity and a simple technological advance which allowed us to sample a previously inaccessible part of the tropical forest. The canopy or upper layer of the tropical forest is really the last place on earth that remains virtually unexplored. Until Erwin's study there had probably been fewer canopy samplings than explorations of the ocean depths.

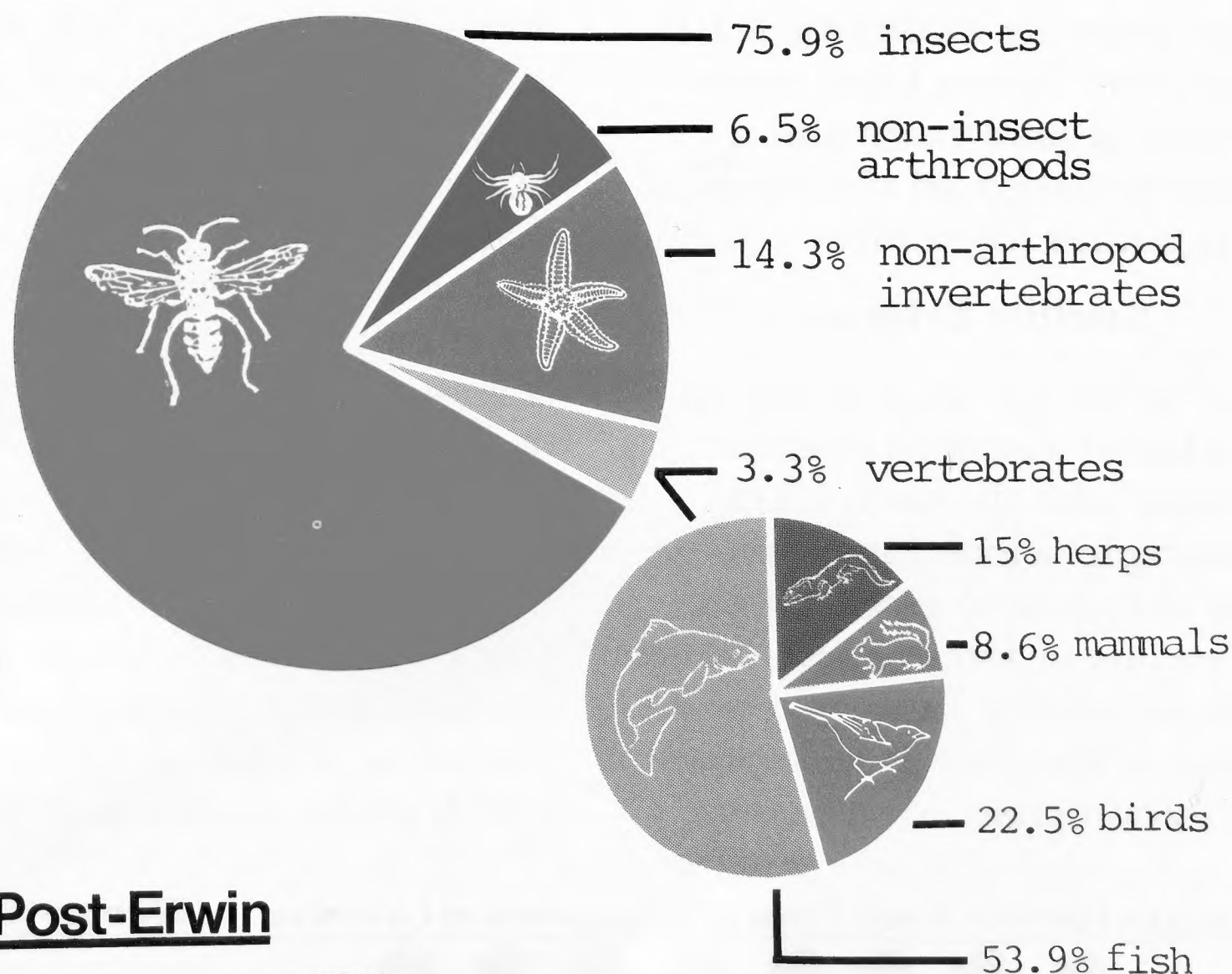
Tropical forests—the richest of tropical environments—are paralleled in the sea by coral reefs, where there is a bewildering profusion of species that interact in the most complex ways. Both the coral reefs and the forests are seriously threatened by human activities, but the danger to the forests is the most imminent. The extent and significance of the continuing destruction of the rainforest is the subject of considerable argument. Some

These graphs illustrate the effects of Erwin's studies on our estimates of life on earth. Invertebrates dominate the world, both in numbers of animal species and in numbers of individuals. Even not counting insects, invertebrates outnumber vertebrates (animals with backbones). Vertebrates dominate in size and also in zoo exhibits. Most zoos exhibit animals—amphibians, reptiles, birds, and mammals—from less than one percent of the species that constitute the animal kingdom. The National Zoo's Invertebrate Exhibit, planned for late 1986, will help redress this imbalance with a comprehensive display of invertebrates from microscopic protozoans to elegant spiders.

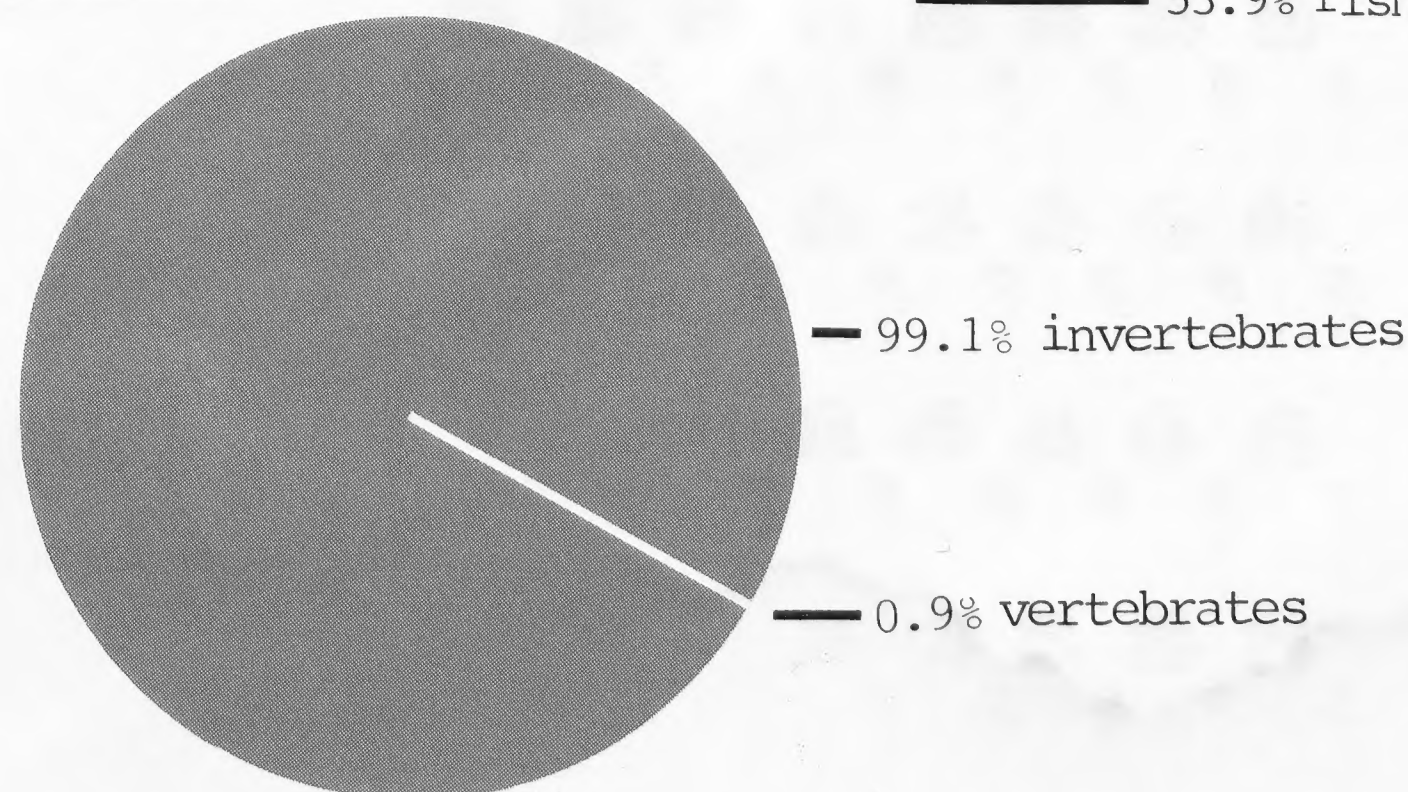
Number of Animal Species on Earth



Pre-Erwin



Post-Erwin



The canopy or upper layer of the tropical forest is really the last place on earth that remains virtually unexplored.

optimists, usually non-biologists, have argued that forest destruction has been exaggerated by conservationists, its consequences blown out of all proportion. This attitude is nonsensical to anyone who has lived and worked in the tropics. There the devastation is easy to see: Fly over Panama in the dry season and the pall of smoke that signals the activities of farmers colonizing the forest may stretch from sea to shining sea. In Papua New Guinea I saw rivers the color of mud every time a rainstorm carried off the topsoil of newly cleared forest plots.

Satellite Evidence

But we do not need to rely on this kind of anecdotal evidence. Satellites orbit the earth taking photographs which can be computer enhanced to give an objective picture of forest cover. Studies based on satellite imagery confirm current predictions of widespread forest destruction. Most present

estimates predict an almost total disappearance of tropical moist forest by sometime in the next century. There is little or no argument among biologists about *whether* the forests will go, the discussion is mainly about *when*!

The consequences of this destruction are numerous; they are economic, practical, aesthetic, and cultural. For convenience, I have summarized them in a set of notes (on page 9) that will prove useful if you want to speak and argue the case for saving the tropics. It is a sobering thought that we humans depend for our food on a ridiculously small number of cultivated plants and domesticated animals. These represent a tiny fraction (less than .0001 percent) of the plants and animals found in tropical forests. What potential foods, medicinal drugs, and useful products are still undiscovered in that virtually unstudied system?

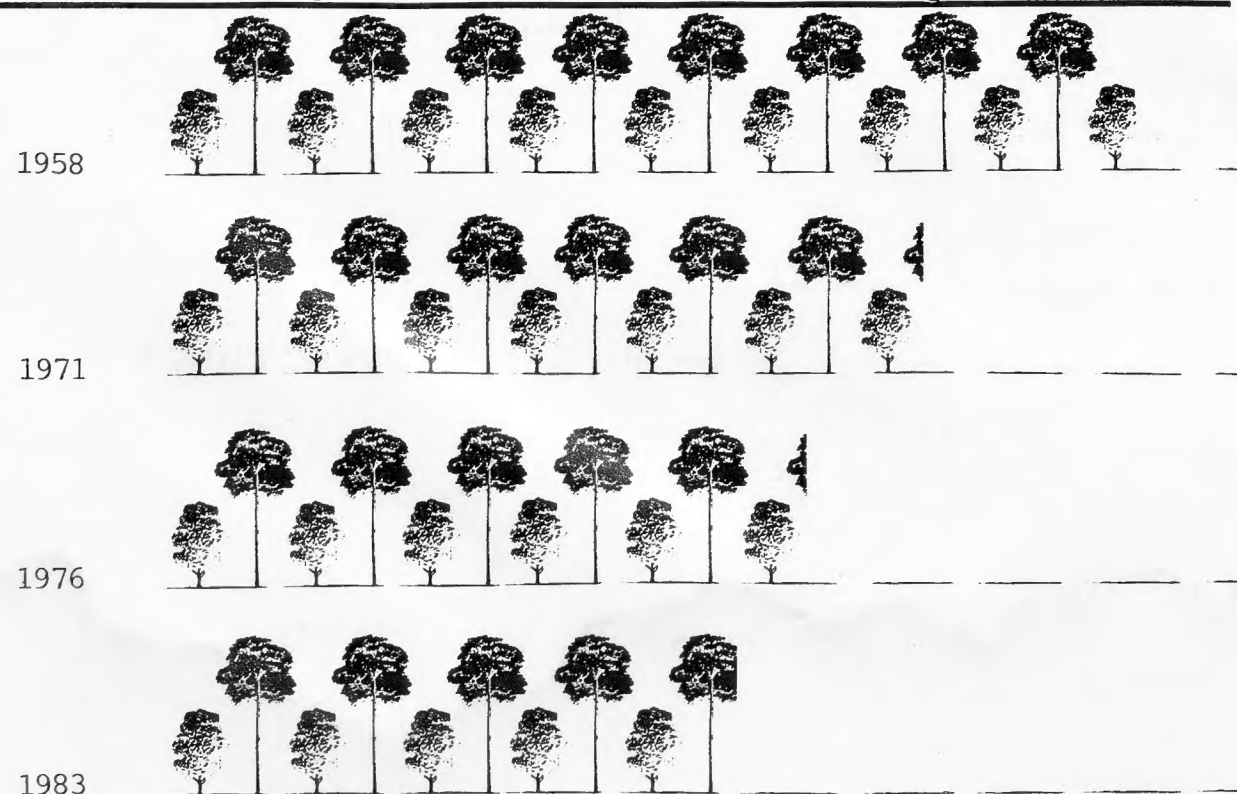
Will all the species go if the

forests are reduced to a few pockets, a few fenced and protected relicts? Probably not, but we will almost certainly face a mass extinction of plants and animals unlike anything that has ever occurred. Extinctions on a mass scale have occurred in paleohistory, but always over a period of many thousands of years. The imminent extinctions are likely to occur in less than a century, a period too short to allow many animals to adapt to the change even if they had that potential.

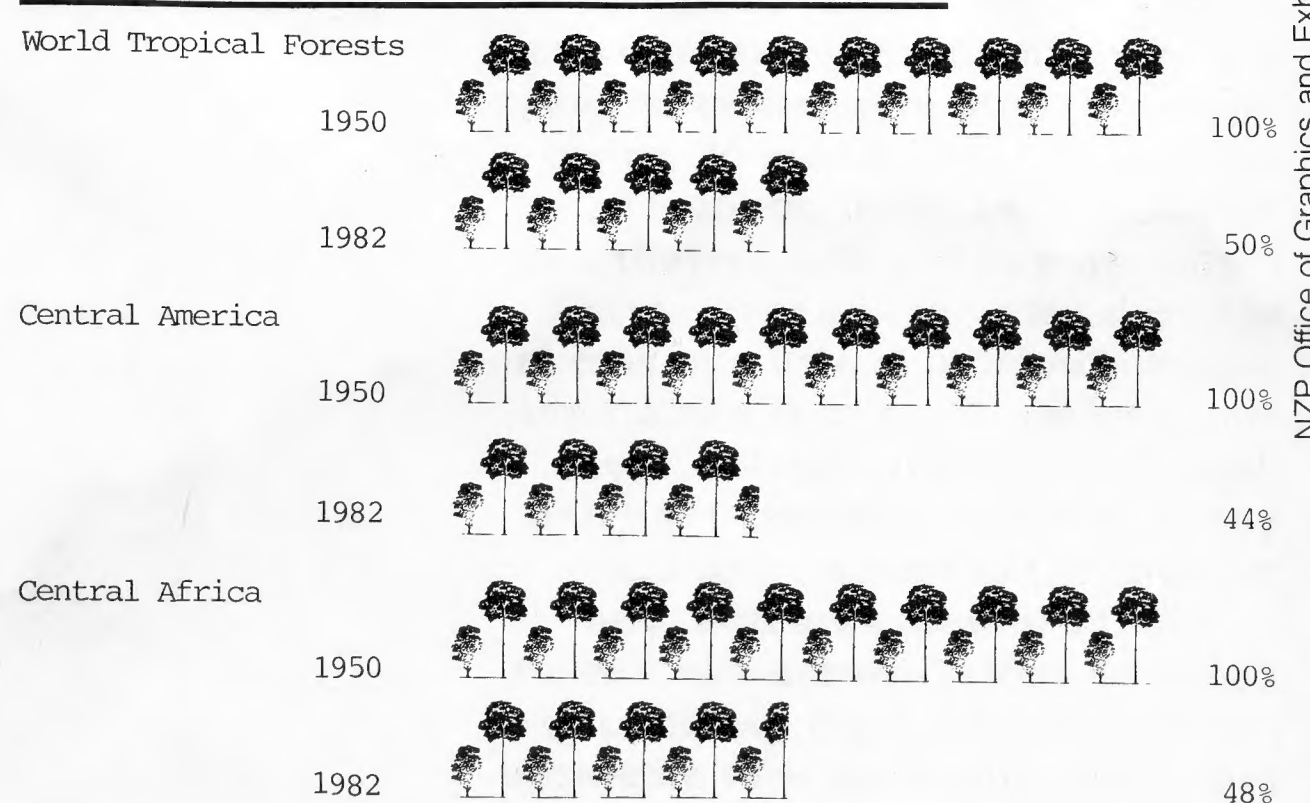
Short-Term Gain

What are the causes of the current destruction and what, if anything, can we do about it? There is no single cause of tropical forest destruction except, of course, man's deliberate attempts to change the habitat for his own benefit. The type of human exploitation varies from place to place, but the gain is almost always short term.

Peninsular Malaysia: Forest Cover as a Percentage of Land Mass



Changes in Tropical Forests Between 1950-1982



The single case of Malaysia (left) highlights the fact that country-by-country analyses of tropical forest destruction conform to the overall trend (right). There are similar data for Burma, Indonesia, Sri Lanka, and so on.

The Value of Rainforests to Mankind

1. **Food.** In many parts of the world, rainforests are immediate sources of food for indigenous peoples. Food may be derived from both plants and animals. Animals that are eaten range from birds and mammals to such things as reptiles and amphibians (lizards, snakes, and frogs). These animals feed on forest products and convert them into protein, etc., suitable for human consumption. For instance, in central Amazonia, fish constitute the largest single source of protein for much of the population. More than 75 percent of all fish sold are species that feed on fruits and seeds in flooded forests. Forest plants are also cropped directly by man.

2. **Economically valuable products.** Plants and animals of the forest can be cropped for non-food products. These may include resins, sap, medically active compounds, spices, herbs, skins, horn, and so on. In the past many resources have been overexploited but sustainable yields are possible. Examples include butterfly farming in Papua New Guinea, iguana farming in Panama, and so on.

3. **Biomedical value.** Over 30 percent of all pharmaceutically active compounds were originally derived from plants—many of them from tropical species. Only a tiny fraction of plants have been tested for such activity but there are good reasons to assume that tropical plants should be a major potential source of future pharmaceuticals. This is because plants have evolved, in their own defense, compounds with insecticidal, fungicidal and anti-bacterial properties as well as compounds to deter browsing by herbivores. For example, perhaps a fungicide that evolved to protect leaves from molds could protect humans from ringworm. Rainforest animals have also produced a vast array of defensive compounds worthy of investigation.

4. **Genetic Value.** The genetic resources of tropical forest ecosystems are exceptionally diverse. Possible applications include all the uses outlined above. It is

interesting to note that 85 percent of our food is derived directly or indirectly from only 20 species of plants, and 60 percent from only three species: corn, wheat, and rice. As Peter Raven, Director of the Missouri Botanic Garden, has said: "It stands to reason that among the world's remaining 235,000 known flowering plant species, there must be many more that could provide important sources of food—not to mention medicines, oils, chemicals, and sources of renewable fuels."

5. **Service value.** The forests act as "organs" of atmospheric conditioning and important agents of waste disposal, nutrient cycling, soil formation, natural pest and disease control and pollination. Recent studies in Amazonia suggest that large tracts of forest may generate the rainfall patterns that sustain them. Thus their removal could lead to both regional and global changes in patterns of climate. If the so-called "greenhouse effect" is augmented by the burning of forests and their destruction, the resulting climatic changes in the temperate region could affect large areas of agricultural land.

Non-Material Benefits

6. **Scientific Value.** The richest ecosystems on earth are virtually unknown. Basic studies in all aspects of earth science can benefit enormously from rainforest studies. Dollars yield more research returns from tropical research than that conducted almost anywhere else.

7. **Aesthetic Value.** The sheer wonder of the living world of the rainforest has, so far, *only* been available to most of us through second-hand experiences: books, films, TV, zoos, museums, and so on. The fact that rainforest tourism is increasing suggests that it could have an important aesthetic and cultural value to mankind.

(Photocopy this page and give it to others. Send your comments on it to Dr. Michael Robinson, Director, National Zoological Park, Washington, D.C. 20008.)

The developing world simply cannot afford the luxury of a long-term view.

Before we temperate-region inhabitants pontificate on the morality of destruction, we need to remember that we have already severely ravaged and modified most of the habitats in our own countries. What is happening now in the tropics happened in Europe hundreds of years ago—except that European forests were destroyed by population pressures markedly smaller than those occurring in the Third World today. Furthermore, these forests, in comparison with tropical forests, were relatively poor biological communities. There was really much less to lose. Interestingly enough, however, many of the forces of destruction were the same. Neolithic man destroyed forests to produce agricultural land and cattle pasture and to obtain lumber and firewood. This

is exactly what is happening now, but present destruction is greatly exacerbated by the quest for foreign exchange, through commodity production, to buy manufactured products from the developed world.

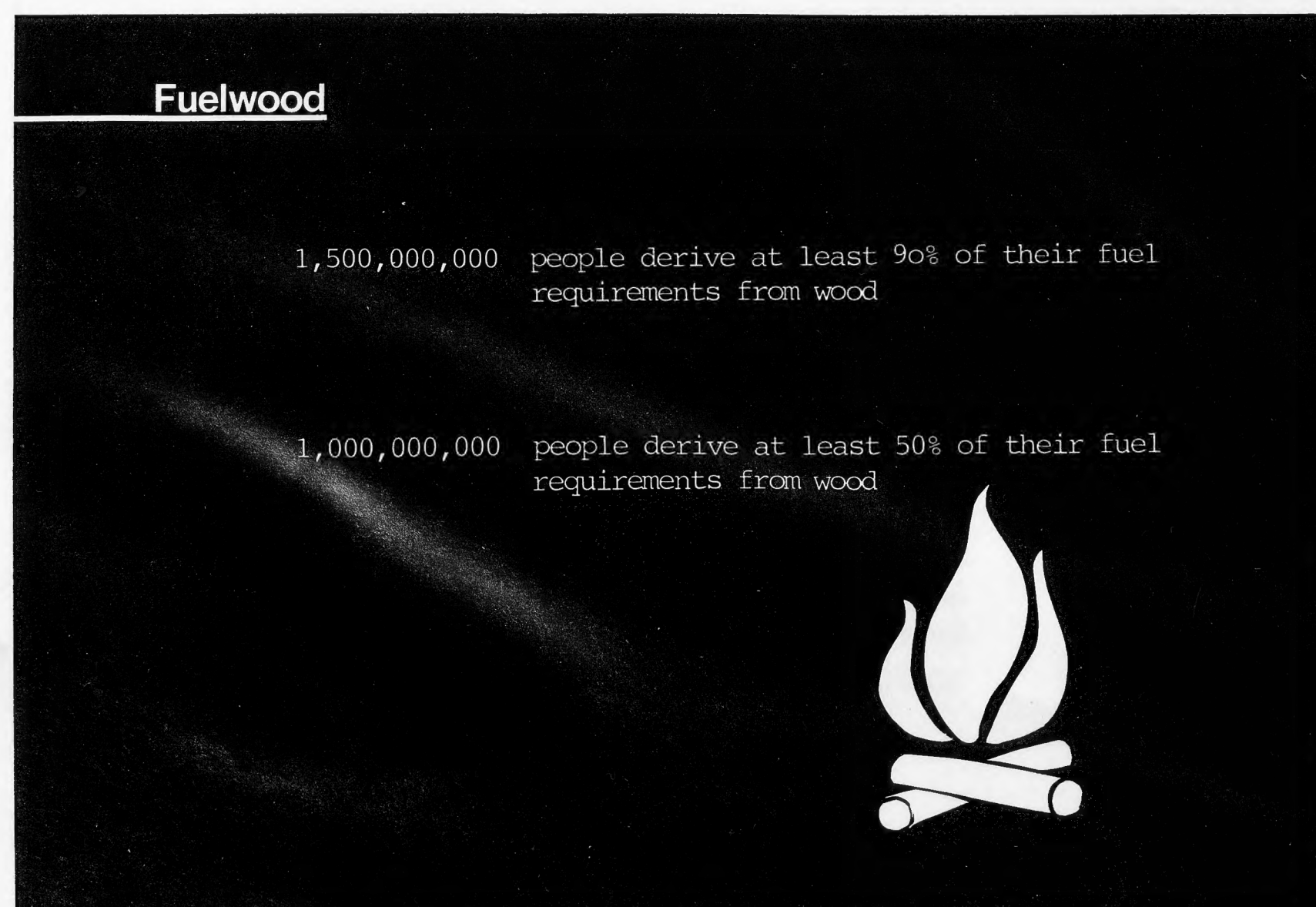
People in the tropics need food, fuel, and construction materials. They also need commodities to buy the necessities of modern life. We cannot expect them to accept forever an international division into rich and poor nations, where they are permanently poor.

All this means, I think, that pressures on tropical forests will increase, not decrease. Development is an imperative hard to halt, even if it were desirable to do so. Solutions within the context of existing nationalisms seem to me to be impossible; internationally planned development seems

utterly improbable. In the very short term we need to slow the destruction until an investigation of alternatives can at least take place. Now is the time for a massive increase in all kinds of research related to tropical biology, agriculture, forestry, fisheries, and so on. Unfortunately, the priorities throughout the developed world are elsewhere, while the developing world simply cannot afford the luxury of a long-term view. The recent famine in Ethiopia is, I think, a portent of things to come.

Into this extremely gloomy prognosis, I would inject a word of optimism. I believe that human intelligence can put right the problems caused by human stupidity, greed, and the pressures of poverty. The zoos of the world are working to save species in a way that transcends boundaries and rivalries. The Species Survival Plans of the American Association of Zoological Parks and Aquariums are very inspiring examples of cooperation in altruism. These efforts cannot save species on the scale that will be needed if the forest destruction continues, but they are positive signs. We can save an occasional Rembrandt or Botticelli among the threatened animals, but it is physically impossible to save the majority of masterworks.

Nonetheless, the golden lion tamarin story (*ZooGoer*, July-August 1985) highlights all that is excellent in applied conservation biology. With that as an example, nothing is impossible. There are also encouraging signs from re-



NZP Office of Graphics and Exhibits

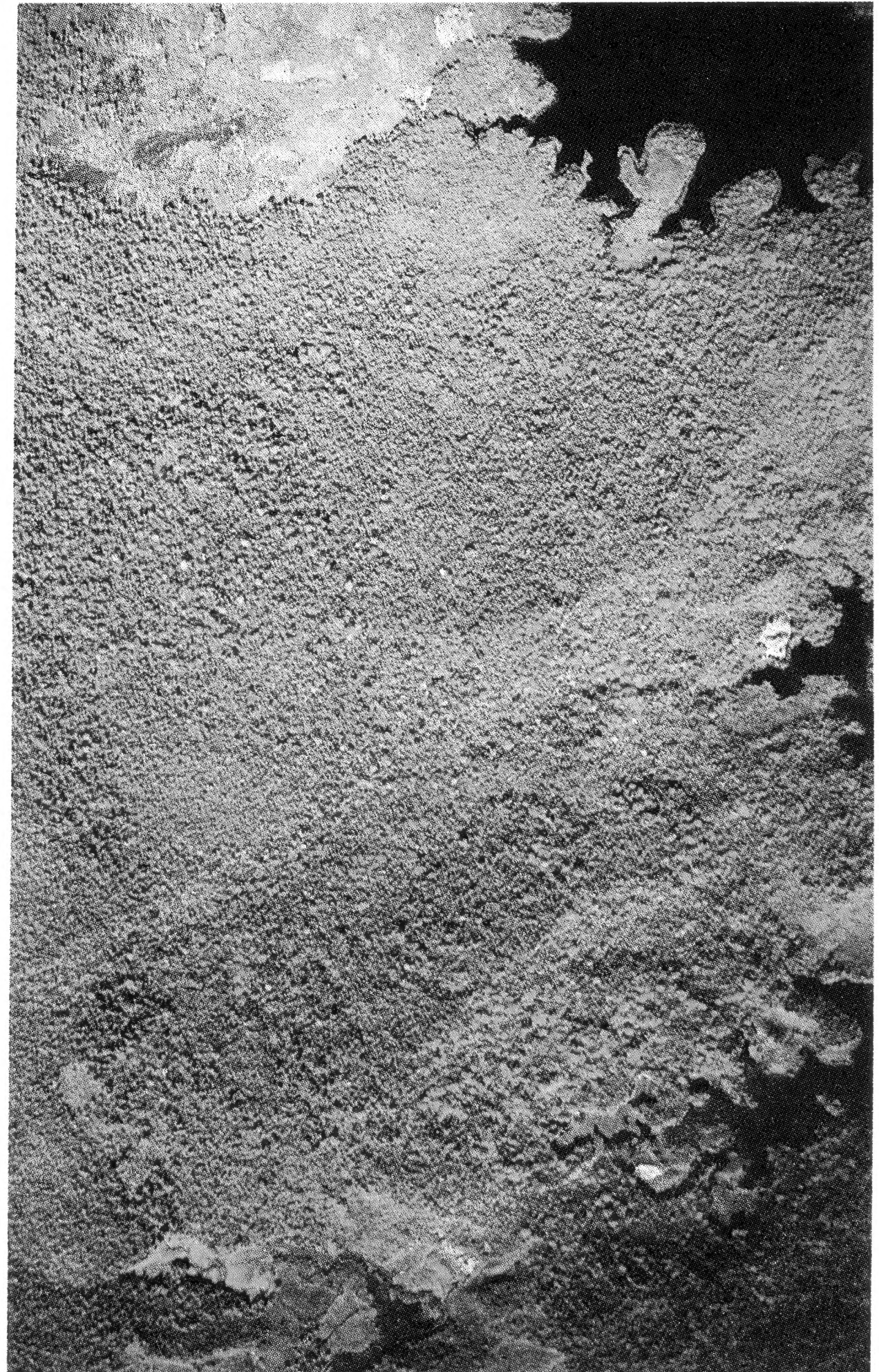
The enormous pressure on trees for fuel is principally a tropical phenomenon.



Decimated by slash-and-burn deforestation, Panama's lowland rainforests will be reduced to remnant patches within the next four years, according to United Nations estimates.



Estimates of widespread tropical forest destruction have been confirmed by computer-enhanced satellite photographs that differentiate between vegetation (red in the photos above) and other areas. (These satellite photos show gypsy moth defoliation of a North American forest over a six-week period.)



A false-color aerial photograph shows recently cleared blotches in the coastal forest of Panama.

search into the reproductive biology of animals. Techniques of the cryopreservation of spermatozoa and embryos, successful implantations of embryos in surrogate mothers, and the preservation of genetic material all bring the former province of science fiction into the realm of present reality.

There is probably no substitute for the preservation of biospheres; but this is not technically impossible. All we need are the resources. The talent is surely there... worldwide. □

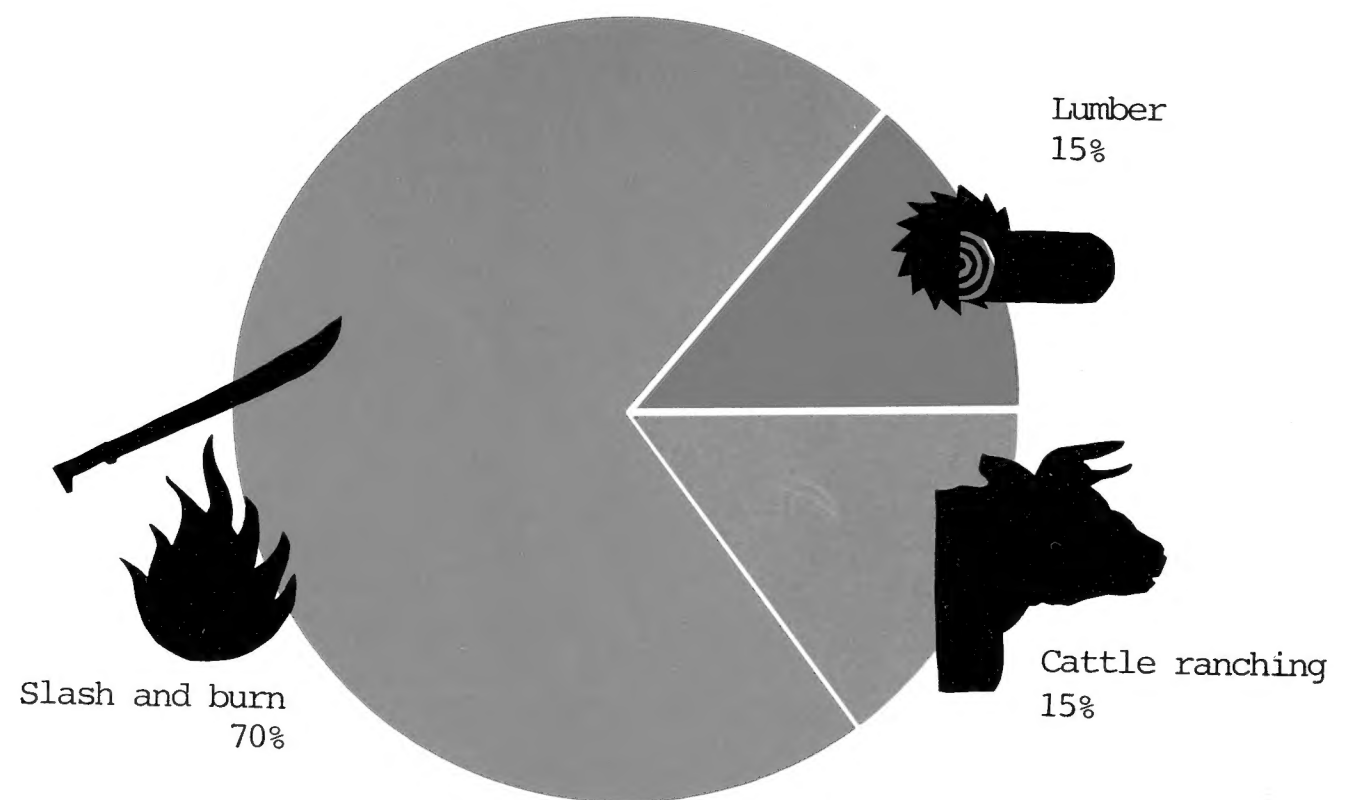
(Send your responses to this article and/or your thoughts on global problems of forest destruction to: Dr. Michael Robinson, Director, National Zoological Park, Washington, D.C. 20008.)

Further Reading

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"Slash and burn" land clearing, primarily for agricultural uses, is responsible for most tropical forest destruction (above). The decision matrix (below) diagrams some possible steps in a program to save our tropical heritage. The "Rubinoff scheme" (upper left) proposes that developed countries pay subsidies in proportion to the area of forest that is preserved. This would provide developing countries with hard currency that would enable them to buy food from the surpluses of the developed world. Other proposals have been put forward to subsidize national parks and reserves from taxes on tropical hardwoods imported into developed countries.

Causes of Forest Destruction: Central America



Major Problem: Forest Destruction

Optimal Solution

Moratorium on Destruction

Rubinoff Scheme
\$ ≠ Y

Result

\$ ≠ Y

Time Gained for Rescue

Banks

Gene
Embryo
Seed

Research

- *Basic Biology
- *Appropriate Agronomy
- *Appropriate Forestry
- *Ethno-medicine
- *Traditional Agriculture
- *Animal Husbandry
- *Alternative Technology
- *Economic Planning

Suboptimal Solution

Environmental Triage

Protect the most vital habitats: unique communities

Breed Key Endangered Species

Animals
Plants

Secondary Problems

Provide Sufficient Fuel

biogas
plantations
utilization of new species
efficient stoves
alternative energy sources

Develop Economy Non-Destructively

new relations with developed world, particularly aid programs
rational exploitation

Provide Sufficient Food

alternatives to destruction
better use of existing land
use of new species of plants/animals
agriculture
land reform

reforestation
economic reforms

Birdwatch, D.C.

Lynda De Witt

Like many birds, black-crowned night-herons leave their winter home and fly north in spring. Trailing long white plumes, the graceful herons seek out the breeding sites they occupied the year before. Within a familiar stand of trees, they repair old nests, build new ones, and raise their young. This age-old pattern is replayed each year at the National Zoo, where black-crowned night-herons have been nesting for more than 50 years.

"They arrive in March and stay until late summer," said Joan Smith of the Zoo's Ornithology Department. If this year is like the last, about 25 pairs of the stocky herons will breed in trees around the Great Flight Cage.

The Zoo's natural setting attracts a wide array of wild birds. Wood thrushes, Carolina wrens, red-tailed hawks, kestrels, cedar waxwings, mourning doves, mockingbirds, catbirds, and pileated and red-bellied woodpeckers are among the many wild birds seen at NZP.

The unique blend of natural and created Zoo habitats attracts breeding robins, black vultures, tufted titmice, and grackles. Last spring a titmouse was seen plucking hairs from a sleeping red panda to line its nest, while grackles regularly make their homes in the English ivy grown in the tiger exhibit—a risky location where at least one fledgling has been the

prey of a big cat.

Wild bird visitors are not only welcomed, but encouraged. To attract hummingbirds, the Zoo planted bee-balm and lobelia near the Reptile House and various other sites. Another hummingbird favorite—trumpet vine—grows in front of the Small Mammal House, and more will be planted soon, said Dr. Edwin Gould, curator of mammals and a gardening enthusiast.

Although numerous wild bird species breed at the Zoo, many more seek winter refuge here. Attracted to the heated ponds and abundant food, migrating ducks descend in droves. "More than 900 mallards have been on the lower duck ponds at one time," said Smith. "They practically walk on top of each other. We have to put out enough food to ensure that our own birds get fed as well." Scores of American black ducks—a species on the decline—also spend the winter here. And a few black-crowned night-herons stay on. Last winter, Smith counted eight.

During spring and fall migration and throughout the winter, five bird feeders help nourish a variety of songbirds. Keeper Vince Rico put the feeders in Beaver Valley, an inviting strip of wooded land that runs from the gibbon enclosures to the polar bear exhibit. But, between squirrels stealing seed and thieves stealing two of the feeders (the feeders were replaced), playing host to local



Frequently sighted along local waterways, great blue herons gather to breed in southern Maryland refuge areas. Overleaf: A family of Canada geese explores the banks of Rock Creek near the Zoo. (Photos by Pat Vosburgh)

Freelance writer Lynda De Witt is an avid bird watcher.





Milton Tierney



An immature black-crowned night-heron preens outside the Bird House.

James Lynch



Always on the lookout for easy pickings, black vultures scout for scraps after the polar bear has eaten its fill.

Benjamin Boblett



Believed to be making a comeback in several parts of the country, bald eagles are occasionally sighted soaring over the District and nesting in trees along quiet sections of the Potomac.

birds is not an easy task.

In cold weather, song, white-throated, and tree sparrows join the ever-present house sparrows that have found a freeloader's paradise in the Zoo's Great Flight Cage. The small birds easily slip through the cage's open wire framework, lifting seed and cavorting with the captives.

City Bird Watching

The National Zoo is only one of many parks that help maintain Washington's diverse bird population. In all, about 80 species of birds breed in the city. Add migrants and winter residents to that number, and the total is up around 300. Birder extraordinaire David Czaplak has seen most of these plus many rare species in his 10 years of bird watching in the District. While local suburbs are home to bird-rich regional parks and preserves, the islands of habitat created by the city's numerous small parks make urban bird watching easy, Czaplak says.

His favorite spot, Battery Kemble Park, is a wooded area with a large field. This park—easy to walk through in a day—is at its peak in spring and fall when migrating warblers, thrushes, hawks, sparrows, and vireos pass through. A similar range of migrants can be found in Hazen Park, where broad-winged hawks nest in the summer.

Another good place to see hawks as well as owls is the National Arboretum, says Czaplak. (To find owls, he looks for smaller birds such as sparrows and starlings clustered around a hole in a tree. The birds regularly attack, or mob, owls and other predators in this way.) Bald eagles, once a common breeder in the Arboretum, are occasionally sighted along the Potomac River.

The Canada geese and gulls that spread out along the river in sum-

mer gather at Hains Point when the weather turns cold. For the past six years, Czaplak has seen a lesser black-backed gull—a bird native to Europe—on the Hains Point golf course. A snowy owl, another rare visitor, spent one recent winter on the flat roof of the Justice Department. “It must have thought it was on the tundra,” explained Czaplak.

Claudia Wilds, author of *Finding Birds in the National Capital Area*, spends much of her time at Chin-coteague counting shorebirds as part of an international monitoring effort. But, when she does bird watch in the city, she visits Glover-Archbold Park, Dumbarton Oaks, and Roosevelt Island.

Beginning bird watchers may wish to get oriented at the Smithsonian's Museum of Natural History. There, on the ground floor, is an ongoing exhibit of birds common to the D.C. area. Though a bit faded, the stuffed specimens will help novices become familiar with local species.

Visiting the Zoo and watching captive birds up close can also help sharpen bird watching skills. Wilds leads a field trip to the Zoo every year to help people learn how to identify birds, especially such tricky species as the American black duck and the Barrow's and common goldeneyes. The Audubon Naturalist Society sponsors other local birding field trips. FONZ, too, organizes birding adventures throughout the year, from nearby day trips to international safaris.

Watching and identifying birds is a peaceful and satisfying pastime. It's peaceful because it is quiet, and it's satisfying because you find yourself learning a lot about birds just by observing them. It is also a great way to get better acquainted with your neighborhood, your city, and your National Zoo. □

Benjamin Boblett



Attracted by their counterparts at NZP, wild black-crowned night herons nest each spring in trees around the Great Flight Cage.

Pat Vosburgh



Wintering evening grosbeaks are drawn to Beaver Valley feeding stations.

Pat Vosburgh



The sight of a young mockingbird perched in the greenery heralds the arrival of spring at the Park.

The Malayan Tapir: A Relic of Pre-History

Susan Lumpkin

Climbing, swimming, sliding, diving, splashing, running—in all these sports the Malayan tapir excels. Yet at first glance, the placid tapir, plodding on short, stout legs as its long snout combs the ground, appears anything but agile. Hours spent wallowing in muddy water seem unlikely to keep the tapir in Olympic form. But when disturbed or frightened, its athletic talents shine, and its sudden dive and upstream swim often leave a hungry tiger or leopard to make other dinner plans.

Despite its James Bond flair for escape, the Malayan tapir now faces a new threat to its survival, and there is literally nowhere to run. The species lives only in the dense tropical rainforests of Thailand, Burma, Malaysia, and Sumatra. As is the case throughout the world's tropical regions, these forests are rapidly being cleared by loggers and farmers; as the forests disappear, so do the tapirs, which even in the best of habitats are thinly distributed and few in number.

Tapirs are Perissodactyls—the so-called “odd-toed ungulates”—a group of mammals that also includes the horse and rhinoceros. Like their rhino relatives, tapirs appear to be primitive relics of pre-history, animals forgotten by evolution as other species acquired sleek, modern lines. Ten million years ago, tapirs little different

from the Malayan roamed the warm climes of the Americas and Asia (a piece of evidence often cited in discussions of continental drift). Now only four species remain: three living in the South American tropics and one—the Malayan—in Asia. All are in danger of extinction.

Fortunately, tapirs thrive in captivity. With its recent acquisition of a pair of young tapirs, the National Zoo will join other zoos in a captive breeding program designed to ensure the survival of the Asian species. A captive population of Malayan tapirs will also enable us to learn more about this unusual and little-studied ungulate.

The Malayan tapir is completely nocturnal. Its coloration—black except for a “saddle” of greyish-white across the back—conceals it almost entirely on moonlit jungle nights, as the solitary animal zig-zags through the forest to feed on succulent vegetation. It seldom takes more than a few leaves or shoots from any particular plant, and even after pushing over a young sapling, the tapir nibbles only briefly on its tender leaves and twigs.

Picky? Perhaps. But tapirs may appear to be choosy eaters because they are actually mixing plant poisons. Many tropical plants produce toxins as a defense against their herbivorous predators—insects, reptiles, and birds as well



Domino, a one-year-old male Malayan tapir,



Jessie Cohen, NZP Graphics

as mammals. For a large animal, small doses of these toxins have no ill effects. In fact, most of our savory spices—like cinnamon, cloves, and coriander—are potent poisons, palatable to people but deadly or at least distasteful to smaller species. By selecting only a few leaves from any one plant and usually taking young leaves with the lowest concentration of toxins, tapirs avoid building up potentially lethal levels of a single poison.

Tapirs never stray far from water. Vegetation is always lush along streams; swampy areas are ideal for sleepy wallowing—the tapir's preferred daytime pursuit; and a pond or lake into which a tapir can dive provides protection from predators. By some accounts, tapirs are nearly amphibious, able to spend several minutes submerged in water, even crossing deep streams by walking underwater along the bottom.

In captivity, tapirs are given pools or pond-wallows, where visitors will often see them resting after a long night spent foraging for their zoo fare of fruits, vegetables, and alfalfa.

Two or three tapirs, one male and the others female, may share a zoo wallow, but in the wild adult tapirs tend to go their ways alone, presumably only coming together to mate. No one has ever seen wild tapirs mating, but mating in captive tapirs is wild enough for anyone.

Courtship often begins with a dance: The male tapir jumps back and forth in front of the female while tossing his head and waving it from side to side. He then rushes the female, who runs off at a gallop with the male in hot pursuit. Both members of the excited pair emit loud shrill whistles and splash copious quantities of urine. During pauses in the chase, the male and female stand nose to tail,

sniffing each other. But this temporary lull often erupts into violence, with the male trying to bite the female's hind legs and vice-versa. Sometimes both sit down to protect their shanks from the fierce attacks. Renewed chasing, whistling, and urine splashing shortly follow such a standoff.

Slowly, the intensity subsides and the violence diminishes. The male tapir begins gently to place his chin on the female's croup and gradually the female accepts his touch. Soon she permits him to mount for mating. This entire sequence may be repeated several times during a two or three day period before the mating urge subsides.

Malayan tapirs produce a single baby after each 13-month pregnancy. The long wait is worth it. In a world of adorable baby mammals, newborn tapirs are as cute as they come. Their charm is due to the camouflage coloring of their "birthday suits," for, unlike adults, young tapirs wear striking yellow and white spots and stripes on their dark brown coats. While conspicuous at the Zoo, this color pattern renders wild babies invisible as they lie in the verdant foliage of a tropical forest. The pattern persists for several months, fading gradually, until by six months of age, the young tapir looks little different from its parents.

The Zoo's two new tapirs are just out of toddlerhood themselves, so it may be a few years before we see such spectacular infants here. But the adults, as impressive as they are rare, can now be seen splashing and wallowing in the Hardy Hoof area alongside their Asian associates, the Eld's deer and muntjac. And we'll keep you posted on the possibilities of hearing the pitter-patter of tiny tapir feet. □

came to NZP on loan from the Memphis Zoo.



'Roo at the Zoo. The warm breezes of spring spur this red kangaroo mother and joey into playful antics. Mother and young share a strong bond, and the joey sticks close by the mother even after a tiny newborn has taken its place in her pouch. Photographs by Milton Tierney.

Zoos Through History

Betsy Blair

Zoos are so much a part of urban life today that it's hard to believe most in the United States, including the National Zoo, have yet to pass the century mark. The public zoo as we know it got its start less than 200 years ago during the rise of industrialized society in Europe, yet its roots lie in an elite tradition of animal collecting that extends thousands of years into the past and, quite literally, to the ends of the earth.

Rulers of ancient civilizations, from the Mediterranean to the Far East, often kept wild animals as curiosities or as symbols of power. But unless these exotics were paraded before the public in royal displays, most people never saw them. The animals were regarded as private property for the amusement and delight of a privileged few.

In Europe, the fashion of keeping private menageries waxed and waned over the centuries. Royal families often passed them on from one generation to the next, building up large menageries when it suited a particular monarch's fancy, then letting the collections decline when keeping them went out of style or a successor showed no interest. As was the case in ancient times, the public almost never had access to these collections.

By the 18th century, explorers'

and traders' reports of the fascinating species seen in newly discovered lands had generated great excitement among the public "back home" in Europe. This interest in unusual animals came at a time of increasing affluence, when urban populations made up of a growing middle class were building the resources that could support public zoos. Zoologists, whose exposure to exotic animals had been limited to the chance donation of carcasses from private menageries, were particularly eager to build public institutions where they could study and classify the wealth of new species that were being discovered. All of these factors contributed to the birth of the first public zoos in Europe in the late 18th and early 19th centuries.

Public Zoos

The public got its first zoo when the Austrian monarch Joseph II opened to his subjects the royal menagerie at Schonbrunn, near Vienna, which had been built by his father Francis I for his wife Maria Theresa. Today Schonbrunn is the oldest zoo in existence, with remnants of the past to prove it: A rococo breakfast pavilion, built so that Maria Theresa could watch the animals as she ate, still stands at the Schonbrunn Zoo.

Private menageries also supplied the animals for another of the earliest public zoos. After the French Revolution, many of the menageries owned by the aristoc-

racy, including Louis XVI's collection at Versailles, were raided. Most of the animals were butchered and eaten, but those that were spared were sent to the Jardin des Plantes, a Parisian institution built in 1635 for the study of medicinal plants. The scientists at the Jardin initially objected to having to feed and care for the abandoned menagerie animals, but they quickly warmed to the opportunity to study these live specimens. And since the animals now belonged to the people of France, the public was allowed to in to see them.

The first institution deliberately created for both zoological study and public education and recreation was the London Zoo, which opened in 1828. The zoo was the brainchild of Sir Stamford Raffles, a British zoologist and statesman best known as the founder of the colony of Singapore. Inspired by the opportunities for zoological research offered by Paris' Jardin des Plantes, Raffles had organized the Zoological Society of London in 1826 to build and support a public zoological garden for scientific research and public education.

Raffles died of a stroke before he could see his work completed, but the new zoo proved an immediate success. Gifts of exotic animals poured in from all corners of the British Empire, providing the scientists with plenty of material for their research. Sunday afternoons at the zoo became *de*

Betsy Blair is a freelance writer based in Dallas, Texas.

rigueur for throngs of Londoners. Admission was originally limited to Society members and their guests, with the annual cost of membership beyond the reach of working-class laborers. But by 1848, the park was open to everyone for a small fee.

The London Zoo proved to be such a hit that other zoos began springing up throughout Europe. By 1865, 26 zoological parks had been built in Europe as well as other parts of the world. The United States, however, was slow to catch on to this trend, primarily because it lacked the far-flung empires and worldwide trading networks of European nations, and therefore had less access to exotic species. Moreover, except in the northeast, there were few American cities large and prosperous enough to support a public zoo.

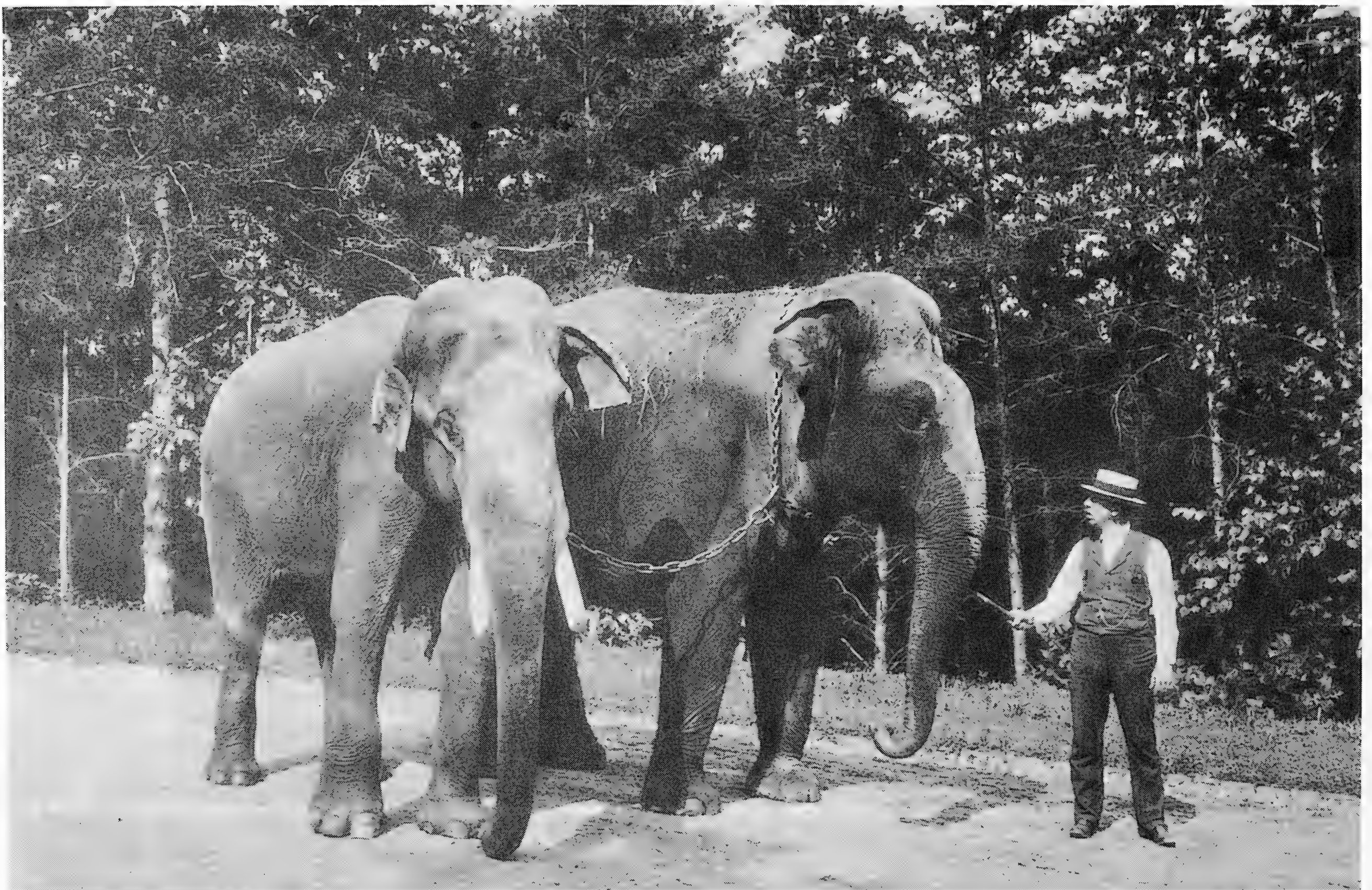
So the earliest American zoos were relatively small menageries built for the amusement of an eager populace. Among these were the Central Park Zoo in New York, which opened in 1865, and the Buffalo and Lincoln Park Zoos, which both opened in 1870. The first major American zoo built for scientific objectives as well as public recreation was the Philadelphia Zoo, which opened in 1874, almost 50 years after the London Zoo got its start. Other such institutions soon followed, and today, the United States has more than 100 zoos.

Preserving Native Species

The National Zoological Park was the first to be dedicated to the preservation of America's native species. William T. Hornaday, who

was the major force behind the movement to build a zoo in Washington, worked for years to convince Congress that the nation needed a zoo to protect and conserve threatened North American species, particularly the bison. In 1889, after much lobbying by Hornaday and others, Congress finally agreed to help finance the park, and the Smithsonian's National Zoo opened soon afterwards in its present Rock Creek location.

The Zoo's start was hampered by years of political fighting about the definition of its aims, and whether it should be funded by the Congress or the District. Often in its early years, the National Zoo found itself strapped for funds, which rarely allowed for more than feeding the animals and paying the keepers. Scientific research and public education programs



In the National Zoo's earliest years, head keeper William Blackburne walked the elephants to Rock Creek twice a day for a swim.

almost always fell by the wayside, as was the case for most zoos during the first half of the century, particularly during the two world wars.

Shifting Attitudes

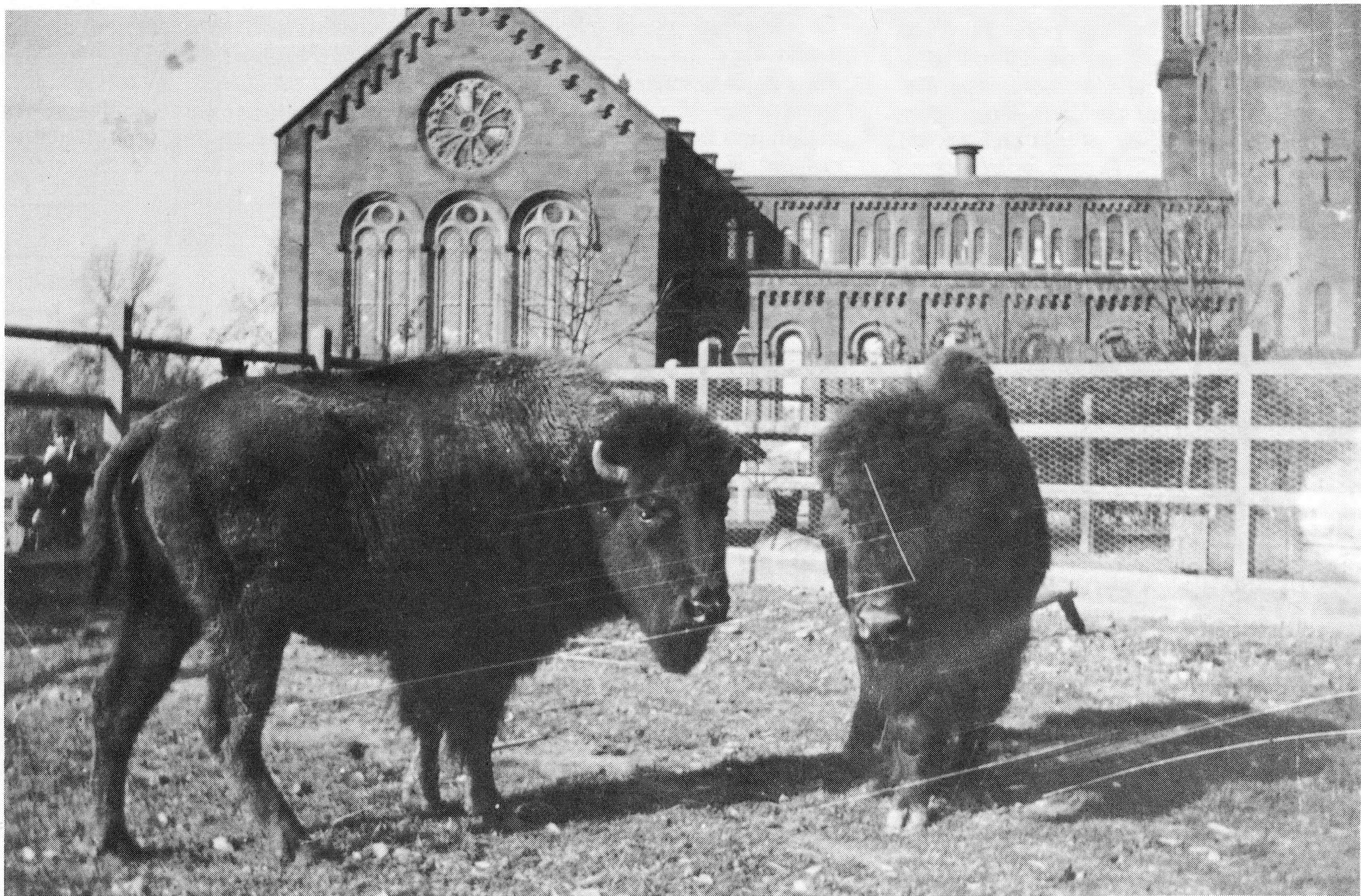
Over the past two decades, however, the growing threat to the earth's wildlife and shifting public attitudes toward the treatment of animals has led to a significant change in the role of zoos. Twenty years ago, when zoos got their animals from the wild, captive breeding often meant the chance arrival of a few babies each year produced by two animals that happened to share the same cage. Today, due to the drastic shrinking of wild animal populations, every major zoo participates in a captive breeding network that pro-

duces a growing share of the animals in captivity. Scientific research also takes place at most of today's zoos, contributing significantly to biological knowledge as well as to the success of captive breeding efforts.

But scientists estimate that even the best captive breeding programs can potentially save only about 900 species from extinction, a mere fraction of the millions of species that could be wiped out if the devastation of the wild continues at its current rate. That is why many zoo professionals believe the most important mission of the modern zoo is to educate its sizable public about the crisis in the wild and convince people to do something about it. Robert Hoage, the National Zoo's Director of Public Affairs, shares this view. "We're trying to get our

visitors to realize that some of the species in zoos, particularly the large mammals like the rhinoceros, are in a period analogous to the last phase of the dinosaur," said Dr. Hoage. "If zoos can make people think about what it would be like *not* to know how rhinos, giraffes, and other large mammals sound, or how they move, or what they smell like, then maybe zoo visitors will work to help save animals in the wild."

The sense of wonder and awe humans feel about living wild animals is as powerful now as it was in ancient times. It's what prompted the creation of exotic royal menageries, what drew thousands to the London Zoo when it opened more than 150 years ago, and what continues to attract millions of visitors to zoos each year. □



Before the National Zoo opened in its present location, two buffalo, obtained by William Hornaday, were housed on the Mall near the Smithsonian "Castle."



Jessie Cohen, N.Z.P. Graphics

The male Anna's hummingbird has a red throat.

NEW AT THE ZOO

The **spectacled bear** twins, born last winter at N.Z.P., emerged from their den for the first time this spring. The cubs represent the Zoo's second successful breeding of this endangered species, so N.Z.P. staff brings some useful experience to their care. Said keeper leader Bill Rose, "When we had our first cub [Willie, now 20 months old], we were afraid he would fall off the ledge in the enclosure. As a preventive measure, we placed hay all around the moat in the exhibit. It turned out that he could balance very well, and our fears were unnecessary. This year we will just watch the cubs; we know what to expect."

A new species at the Small Mammal House is the **zebra mouse**, from Eastern and Southern Africa. In the wild, these striped rodents live in groups of up to 30 members, with each female often producing some 16 offspring a year. Equally prolific in captivity, the Zoo's zebra mice have been separated by sex to avoid a population explosion. Those on display are all females. The males, which fight when kept in all-male groups, are housed individually behind the scenes. They join the females only when they are needed for breeding.

Zoo visitors will be able to recog-

nize the new female **bald eagle**, recently arrived from Patuxent, Md., because females of this species are larger than the males. Look for her in the Eagle Cage in front of the Bird House. And look in the Reptile House for the Zoo's new **hummingbirds**, which thrive in the spacious Cuban crocodile exhibit. Also new to the Reptile House are a **jeweled lizard** and an **ameiva lizard**. Other recent arrivals include tropical **fairy bluebirds** and **barbets** in the Bird House; a **Celebes macaque** and a **colobus monkey**, both born in January, in the Monkey House; a newborn **golden lion tamarin** in the Small Mammal House; a **red kangaroo** joey that peeks from its mother's pouch in the Hoofed Stock area; a young male **white tiger**, on loan from the Omaha Zoo, at Lion-Tiger Hill; and a pair of rare **Malayan tapirs** (see p. 16). A sneak preview of the upcoming **Invertebrate Exhibit** is now on display in the Lion-Tiger building.

DETECTIVE STORY

Even as Zoo scientists monitor the so-far successful second release of golden lion tamarins in Brazil, a new chapter of tamarin monkey history has begun to unfold at the National Zoo. This time, the drama features the black-and-yellow *golden-headed lion tamarins*—and quite a drama it is, worthy of Agent 007 himself.

The ten golden-headed lion tamarins that arrived at the Zoo on March 15 were among a group of 60 wild tamarins smuggled out of Brazil in 1983. Intended for sale on the black market, where rare and endangered animals bring a high price, the tamarins were eventually traced to Belgium, France, and Japan. After two years of difficult negotiations, the government of Brazil, with the help of international conservation groups, managed to get most of the tamarins returned.

But where were the rescued tamarins to go? An international scientific committee formed to develop solutions to the problem advised against returning the animals to their forest home on the east coast of Brazil. Not only had the tamarins been "out of circulation" for more than two years,

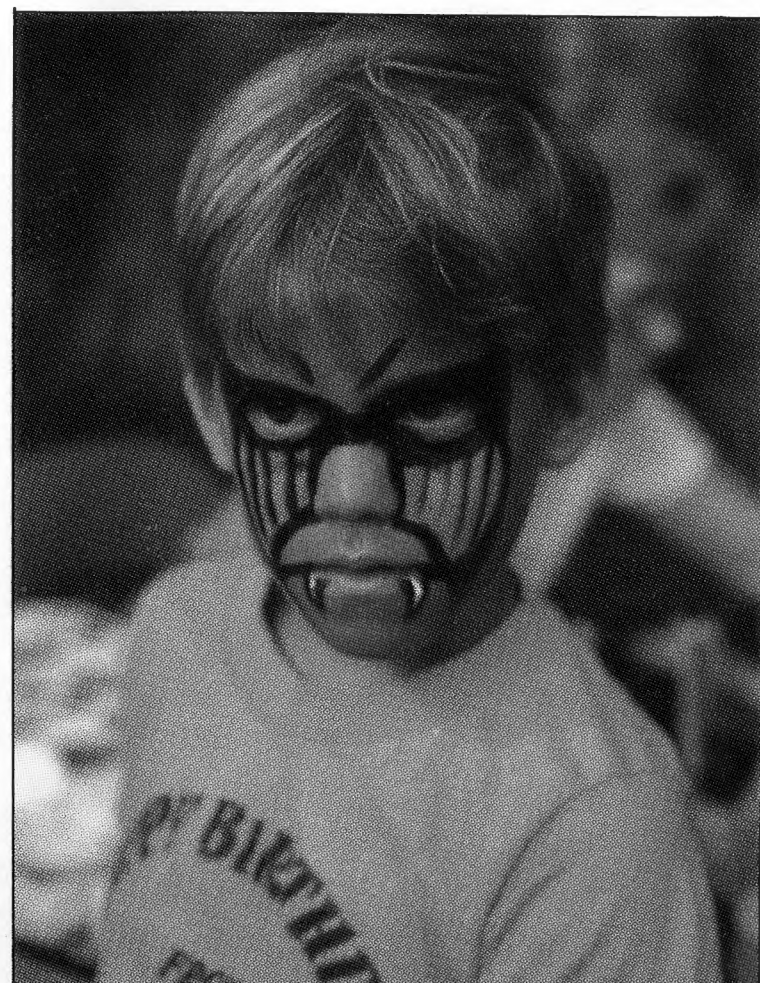
but many had suffered permanent injury while in the hands of the animal traders. Instead, the committee decided to send the tamarins to zoos familiar with closely related species.

The chosen zoos, including N.Z.P. and Los Angeles, will cooperate to develop a bank of information on the behavior and husbandry of these beautiful primates. Little is known about the golden-headed species, so efforts to establish a captive breeding population of the wild-born animals should present researchers with a unique and exciting challenge. Golden-headed lion tamarin numbers have fallen alarmingly low in the wild, due to human encroachment upon their coastal forest habitat, an area that has shrunk to two percent of its original size and could easily vanish altogether.

Once the new arrivals have cleared the standard Zoo quarantine and grown accustomed to their surroundings, a pair of golden-headed lion tamarins will go on exhibit in the Small Mammal House. On display for the first time in the United States, these striking creatures will serve as a living lesson in the importance of tropical conservation.

ZOONIGHT

Come to ZooNight June 6 (members A-M) and 20 (members N-Z). Look



Pat Vosburgh

Face painting is one of ZooNight's most popular activities.

for your invitation in the June-July issue of *Wildlife Adventures*.

HELP A FONZ INTERN

FONZ summer interns will need housing near the Zoo or near public transportation from late May to early September. If you have a room in your house that will be empty this summer or if you need a housesitter, why not help a future Marlin Perkins or Jane Goodall?

These interns are a very select group of dedicated college students—some of the brightest and best of future zoo professionals. To help them, please call Mary Sawyer Hollander, 673-4955.

CALL FOR NOMINATIONS

In accord with Article II of our bylaws, the FONZ Board of Directors is hereby soliciting nominations from the membership.

Board Responsibilities

As members of a "working" Board, FONZ Directors "administer and manage" the affairs of the Friends of the National Zoo. The Board of Directors establishes the policies of the corporation, approves budgets and expenditures, and otherwise directs the activities of FONZ officers and employees. Much of the Board's work is accomplished through active committees, including:

The *Administration Committee* establishes and supervises administrative policies and procedures for FONZ employees.

The *Education Committee* participates in development of FONZ-supported educational programs and supervises educational activities and NZP research grants authorized by the Board.

The *Finance Committee* institutes, develops and supervises fiscal operations.

The *Front Royal Committee* coordinates FONZ support programs at the Zoo's Conservation and Research Center at Front Royal, Virginia.

The *Membership Committee* is responsible for recruiting new members to FONZ and for developing membership activities.

The *Publications Committee* supervises publication and distribution of *ZooGoer* and *PawPrints*.

The *ZooFari Committee* carries out fundraising for the Theodore H. Reed Animal Acquisition Fund and conducts an annual ZooFari benefit gala.

The *Visitor Services Committee* oversees management and operation of FONZ gift shops, food, parking, and other visitor service facilities at the Zoo.



Panda Plaza is one of the most popular FONZ visitor service locations.

All Board members serve on at least one committee, and attend two or more FONZ meetings each month. They serve on a voluntary basis without pay.

Criteria for Selection of Directors

The criteria by which potential candidates are judged for nomination to the Board of Directors are: the candidate's strong interest in supporting zoological education, research and conservation in accordance with the purposes of our corporation; leadership; experience or skills that are needed and would directly benefit the management and operations of FONZ; and willingness and time to participate fully in FONZ work and activities. Candidates must be dues-paying members of FONZ.

Nomination Procedures

Nominations may be made only by dues-paying family, couple, or individual members in good standing. (Senior citizen, contributing and patron memberships of FONZ and members who previously joined the corporation as life members are

entitled to all rights and privileges of dues-paying family, couple, or individual members.) Employees of FONZ or the National Zoo are not eligible for membership on the FONZ Board of Directors.

Nominations must be submitted on an official FONZ nomination form with a biographical sketch of the nominee attached. Nomination forms can be obtained at the FONZ office or will be mailed on request. For information or forms, call 673-4950. Deadline for submitting nomination forms and accompanying biographical sketches is June 21, 1986. Address submissions to: William Bryant, Chairperson, FONZ Nominating Committee, National Zoological Park, Washington, D.C. 20008.

LETTERS

Dear *ZooGoer*,

In "The Bear Truth" [Jan.-Feb. 1986], you refer to bears as hibernating. Bears do not hibernate. They experience a condition known as torpor. During hibernation, the body temperature drops to and fluctuates with the ambient temperature. Torpor is also a lowering of body temperature, but not down to the ambient level.

Susan Baker
Gaithersburg, Md.

Dear *ZooGoer*,

I wish to thank Kathleen Walsh for writing "Keeping Up With Keepers" [Jan.-Feb. 1986]. I have always been interested in zookeeping, but have never before been able to determine what knowledge is necessary for such a job.

Betty Ann Blanchard
Pasadena, Md.

"Notes and News" features letters from and to readers—your zoological questions (with replies from NZP experts), your comments on *ZooGoer* articles, and news notes to you from FONZ and the Zoo. Send your views or questions to *ZooGoer* "Notes and News," National Zoological Park, Washington, D.C. 20008. (All letters and photos become the property of *ZooGoer*, which reserves the right to select and edit letters it publishes.)

The Case of
the Purloined
Tamarins (p. 22)

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National Zoological Park
Washington, D.C. 20008

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